

SPECIFICATION

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Stylesheet Version 1.0

METHODS AND SYSTEMS FOR AUCTIONING PRODUCTS

Cross Reference to Related Applications

This application claims the benefit of U.S. Provisional Application No. 60/207,555, filed May 25, 2000 which is hereby incorporated in its entirety.

Background of Invention

[0001] This invention relates generally to computer network-based auctions and more particularly to a network-based method for auctioning purchase contracts based on actual costs of a product.

[0002] In the course of a business, such as a manufacturing business, a large amount of engineered products are purchased. Since every engineered product is at least slightly different from previously purchased products, accurately assigning a cost to the engineered product is difficult. Furthermore the slight differences between the engineered products often prevent businesses from forming purchase contracts that are both accurate and which encompass a majority of the various engineered products.

[0003] In known systems the most effective way to form purchasing contracts for engineered products was to form a matrix agreement where the most commonly-specified aspects of the product are quoted for the entire product line which may include multiple sizes or ratings as the specified aspects. The resulting matrix often has several thousand entries. Disadvantages to this approach are that much time is spent pricing and negotiating each item, errors are common due to the size and complexity of the matrix and to limit matrix size, only a sampling of available

products are included in the pricing matrix.

Summary of Invention

[0004] In one aspect of the invention, a method is provided for facilitating the auctioning of a pricing model using a network-based system. The system includes a server and at least one device connected to the server via a network. The method comprises the steps of receiving product listing and pricing information data from multiple suppliers, developing an initial regression equation for each supplier based on received product listing and price information data, and combining the initial regression equations for each of the suppliers into a final regression equation for a product line.

[0005] In another aspect of the invention, a system is provided for facilitating the auctioning of purchase contracts for engineered products by implementing pricing models. The system comprises at least one device, a server and a network connecting the devices to the server. The server is configured to receive product listing and pricing information data from multiple suppliers, develop an initial regression equation for each supplier based on received product listing and price information data, and combine the initial regression equations for each supplier into a final regression equation for a product line.

[0006] In a further aspect of the invention, a computer is programmed to prompt a user to enter product listing and pricing information data from multiple suppliers, develop an initial regression equation for each supplier based on the received product listing and price information data, combine the initial regression equations for each of the suppliers into a final regression equation for a product line, transmit to the suppliers the final regression equation and a list of required products, and receive purchase contract bids from suppliers.

[0007]

In another aspect of the invention, apparatus is provided which comprises means for receiving product listing and pricing information from multiple suppliers, means for developing an initial regression equation for each supplier based on the received product listing and price information, means for combining

the initial regression equations for each of the suppliers into a combined regression equation for a product line, and means for receiving purchase contract bids from suppliers.

Brief Description of Drawings

- [0008] Figure 1 is a system block diagram.
- [0009] Figure 2 is an expanded version block diagram of an exemplary embodiment of a server architecture of a system for implementing the network-based application for project management.
- [0010] Figure 3 is a flow diagram of a network-based method for auctioning purchase contracts for engineered products.
- [0011] Figure 4 is a supplier's abbreviated product list.
- [0012] Figure 5 is an exemplary pricing worksheet.
- [0013] Figure 6 is a user interface showing a bid sheet.

Detailed Description

- [0014] Exemplary embodiments of systems and methods that facilitate a network-based method for auctioning products are described below in detail. The systems and methods facilitate, for example, auctioning purchase contracts based on actual costs of an engineered product.
- [0015] Figure 1 is a block diagram of a system 10 in accordance with one embodiment of the present invention. System 10 includes a server sub-system 12, sometimes referred to herein as server 12, and a plurality of user devices 14 connected to server 12. In one embodiment, devices 14 are computers including a network browser, and server 12 is accessible to devices 14 via a network such as an intranet or the Internet. In an alternative embodiment, devices 14 are servers for a network of customer devices.
- [0016] Devices 14 are interconnected to the network, such as a local area network (LAN) or a wide area network (WAN), through many interfaces including dial-in-

connections, cable modems, DSL connections and high-speed ISDN lines. Alternatively, devices 14 are any devices capable of interconnecting to a network including a network-based phone or other network-based connectable equipment. Server 12 includes a database server 16 connected to a centralized database 18 containing project management information. In one embodiment, centralized database 18 is stored on database server 16 and can be accessed by potential users at one of user devices 14 by logging onto server sub-system 12 through one of user devices 14. In an alternative embodiment centralized database 18 is stored remotely from server 12.

[0017] More specifically, in an exemplary embodiment, the network-based method is implemented with an internal computer network including at least one server 12 coupled to remote terminals to form a local network such as, for example, an Intranet. In one embodiment, the Intranet is connected to a globally distributed computer network such as the Internet, including that part of the Internet known as the World Wide Web. Remote users access elements of system 10 from a remote terminal using an Internet connection and a network-browser. The network-browser is, for example, Netscape[®] by Netscape Communications Corporation, or Internet Explorer[®] by Microsoft Corporation, and is downloaded onto a user's remote terminal.

[0018] Figure 2 is an expanded version block diagram of an exemplary embodiment of a server architecture of a system 22 including server sub-system 12 and user devices 14. Server sub-system 12 includes database server 16, an application server 24, a network server 26, a fax server 28, a directory server 30, and a mail server 32. A disk storage unit 34 is coupled to database server 16 and directory server 30. Servers 16, 24, 26, 28, 30, and 32 are coupled in a local area network (LAN) 36. In addition, a system administrator workstation 38, a user workstation 40, and a supervisor workstation 42 are coupled to LAN 36. Alternatively, workstations 38, 40, and 42 are coupled to LAN 36 via an Internet link or are connected through an intranet.

[0019]

Each workstation 38, 40, and 42 is a personal computer having a network

browser. Although the functions performed at the workstations typically are illustrated as being performed at respective workstations 38, 40, and 42, such functions can be performed at one of many personal computers coupled to LAN 36. Workstations 38, 40, and 42 are illustrated as being associated with separate functions only to facilitate an understanding of the different types of functions that can be performed by individuals having access to LAN 36.

[0020] In another embodiment, server sub-system 12 is configured to be communicatively coupled to various individuals or employees 44 and to third parties, e.g., users 46, via an ISP Internet connection 48. The communication in an exemplary embodiment is illustrated as being performed via the Internet, however, any other wide area network (WAN) type communication can be used in other embodiments, i.e., the systems and processes are not limited to being practiced via the Internet. In addition, and rather than a WAN 50, local area network 36 could be used in place of WAN 50.

[0021] In an exemplary embodiment, any employee 44 or user 46 having a workstation 52 can access server sub-system 12. One of user devices 14 includes a workstation 54 located at a remote location. Workstations 52 and 54 are personal computers having a network browser. Also, workstations 52 and 54 are configured to communicate with server sub-system 12. Furthermore, fax server 28 communicates with employees 44 and users 46 located outside the business entity and any of the remotely located user systems, including a user system 56 via a telephone link. Fax server 28 is configured to communicate with other workstations 38, 40, and 42 as well.

[0022] Figure 3 is a flow diagram 60 for a network-based method of auctioning purchase contracts for engineered products. In an exemplary embodiment, the method is a web-based method and the specific products are transformers. The method includes the steps of receiving 62 product list information and pricing data from potential suppliers, developing 64 a regression equation or mathematical model for each supplier based on received product list information and pricing data, e.g., prices on product options, combining 66 the multiple mathematical

models from the individual suppliers into one mathematical model to be used by all suppliers when configuring the purchase contract bids, and receiving 68 bids on purchase contracts from suppliers. In an alternative embodiment, the method includes receiving product list information and pricing data from a single supplier and using known electrical, physical, and manufacturing parameters to formulate an equation and then combining market-level pricing knowledge to form a mathematical model.

[0023] Figure 4 illustrates one embodiment of a desired product list 70, accessible by a group of potential suppliers. List 70 is in the form of an abbreviated pricing matrix and in this example a transformer product line is to be priced by a supplier. The specific items listed are at least some of those items that affect pricing. List 70 is stored in database 18 (shown in Figure 1) on server 12 (shown in Figure 1) and is accessed by suppliers via computer system 10 (shown in Figure 1). In one embodiment, list 70 is transmitted to a potential supplier by email. In an alternative embodiment, list 70 is transmitted to a potential supplier via a web-based information transfer process as is well known in the art. List 70 includes a primary voltage group 72 and a secondary voltage group 74. As part of list 70, primary voltage group 72 and secondary voltage group 74 are divided according to a total transformer voltage rating 76. List 70 provides a notes section 78 which allows a supplier to provide caveats to the supplied pricing information, for example add a percentage to the transformer prices for temperature rating or subtract a percentage for aluminum versus copper windings in the transformers.

[0024] Figure 5 shows an exemplary spreadsheet 80 stored in database 18 (shown in Figure 1) on server 12 (shown in Figure 1). Spreadsheet 80 provides data entry fields 82 into which a potential supplier enters pricing information. Spreadsheet 80 also is in matrix form and is delineated using ratings and groupings from list 70 (shown in Figure 4). Spreadsheet 80 may also incorporate other well known parameters, such as, with respect to the transformer example, delineating a grouping 84 for temperature ratings of the priced transformers. Alternatively, multiple spreadsheets 80 are used to enter pricing information. Again using the transformer example, spreadsheet 80 is a spreadsheet that indicates to the

197713	41712	41709	41702	41701	41699	41697	41696	41695	41694	41693	41692	41691	41690	41689	41688	41687	41686	41685	41684	41683	41682	41681	41680	41679	41678	41677	41676	41675	41674	41673	41672	41671	41670	41669	41668	41667	41666	41665	41664	41663	41662	41661	41660	41659	41658	41657	41656	41655	41654	41653	41652	41651	41650	41649	41648	41647	41646	41645	41644	41643	41642	41641	41640	41639	41638	41637	41636	41635	41634	41633	41632	41631	41630	41629	41628	41627	41626	41625	41624	41623	41622	41621	41620	41619	41618	41617	41616	41615	41614	41613	41612	41611	41610	41609	41608	41607	41606	41605	41604	41603	41602	41601	41600	41599	41598	41597	41596	41595	41594	41593	41592	41591	41590	41589	41588	41587	41586	41585	41584	41583	41582	41581	41580	41579	41578	41577	41576	41575	41574	41573	41572	41571	41570	41569	41568	41567	41566	41565	41564	41563	41562	41561	41560	41559	41558	41557	41556	41555	41554	41553	41552	41551	41550	41549	41548	41547	41546	41545	41544	41543	41542	41541	41540	41539	41538	41537	41536	41535	41534	41533	41532	41531	41530	41529	41528	41527	41526	41525	41524	41523	41522	41521	41520	41519	41518	41517	41516	41515	41514	41513	41512	41511	41510	41509	41508	41507	41506	41505	41504	41503	41502	41501	41500	41499	41498	41497	41496	41495	41494	41493	41492	41491	41490	41489	41488	41487	41486	41485	41484	41483	41482	41481	41480	41479	41478	41477	41476	41475	41474	41473	41472	41471	41470	41469	41468	41467	41466	41465	41464	41463	41462	41461	41460	41459	41458	41457	41456	41455	41454	41453	41452	41451	41450	41449	41448	41447	41446	41445	41444	41443	41442	41441	41440	41439	41438	41437	41436	41435	41434	41433	41432	41431	41430	41429	41428	41427	41426	41425	41424	41423	41422	41421	41420	41419	41418	41417	41416	41415	41414	41413	41412	41411	41410	41409	41408	41407	41406	41405	41404	41403	41402	41401	41400	41399	41398	41397	41396	41395	41394	41393	41392	41391	41390	41389	41388	41387	41386	41385	41384	41383	41382	41381	41380	41379	41378	41377	41376	41375	41374	41373	41372	41371	41370	41369	41368	41367	41366	41365	41364	41363	41362	41361	41360	41359	41358	41357	41356	41355	41354	41353	41352	41351	41350	41349	41348	41347	41346	41345	41344	41343	41342	41341	41340	41339	41338	41337	41336	41335	41334	41333	413
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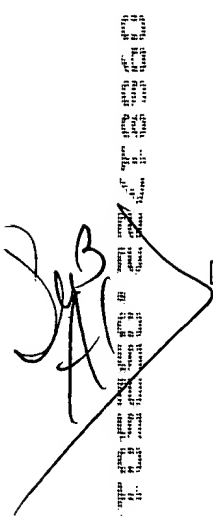
[0026]

$$\begin{aligned} \text{COST} = & 847 + 26.7\text{HVBIL} - 262\text{LVBIL} + 16.3\text{kVA} + 9.02(\text{LVBIL}) \times (\text{HVBIL}) \\ & - 0.0635(\text{LVBIL}) \times (\text{HVBIL})^2 + 0.143(\text{TEMP}^2 \times \text{kVA}^2) / 1,000,000 \\ & - 0.0481(\text{TEMP} \times \text{kVA}) - 0.000025(\text{TEMP} \times \text{kVA}^2) \end{aligned}$$

where HV is high voltage, LV is low voltage, BIL is basic impulse level, kVA is kiloVolt–Amperes, and TEMP is temperature rise. For other products, different final

regression equations exist or can be implemented into system 10 (shown in Figure 1).

[0028] Figure 6 illustrates an exemplary bid sheet 90, in the form of a user interface stored on server 12 (shown in Figure 1) and incorporating the final regression equation for pricing described above. In an alternative embodiment, bid sheet 90 is emailed to the supplier and is received via email after bid sheet 90 has been completed. When bid sheet 90 is implemented for reception of bids in a purchase contract, suppliers are not actually quoting prices based on individual costs for products, rather the suppliers are bidding based on items contained on bid sheet 90, which will determine a price when supplying the product. In the transformer example of Figure 6, bid sheet 90 has been generated utilizing six transformer products 92 including ratings and specifications 94 for parameters 96. The transformers illustrated on bid sheet 90 are not meant to represent actual transformers to be purchased. These specific transformers are displayed to represent data points generated by the pricing equation.



[0029] Products 92 are priced according to a final regression equation 98 generated from supplier inputs, as described above. A per unit price 100 and an item total price 102 are displayed. Coefficients 100 of final regression equation 98 are displayed on the user interface and are the subject of actual bids by the suppliers. A total bid 104 for all items desired is also displayed. Total bid 104 is generated by server 12 using the final regression equation for the individual items, multiplying by a quantity of each item to obtain an item total, and adding the item totals to obtain the total bid. In an alternative embodiment, bid sheet 90 is a spread sheet that includes the appropriate equations to generate total bid 104. Bid sheet 90, in one embodiment, is utilized to provide example product pricing to suppliers so they can view the effects of bidding various values. When a new value is entered for the particular items, individual transformer prices are updated, as well as the total package price to reflect the newly calculated equation values.

[0030]

Using a model to generate pricing accurately represents pricing of a majority of an engineered product line. By using models, electronic auctioning is facilitated,

